Claims

[c1] 1. A method of forming an embossed substrate, comprising:

disposing a substrate a platen a magnetically impermeable stamper comprising a negative of a desired surface feature, wherein the stamper is affixed to a magnetically permeable block comprising an induction coil;

pressing the stamper and the substrate together;

passing an alternating electrical current through the induction coil to raise the temperature of the stamper above a softening temperature of a substrate surface; and

changing the alternating electrical current;

whereby the embossed substrate is formed.

[c2] 2.The method of Claim 1, wherein the relative magnetic permeability of the stamper is in an amount of about 400 to about 800.

[c3] 3. The method of Claim 1, wherein the stamper comprises a material selected from the group consisting of nickel, iron, cobalt, manganese, gadolinium, dysprosium, iron oxide, lithium zinc ferrites, magnesium manganese zinc ferrites, cermets and alloys comprising at least one of the foregoing materials.

[c4] 4. The method of Claim 1, wherein the stamper comprises a magnetically permeable material and a resin selected from the group consisting of polyphenylene sulfide, polythalamide, polyimides, polyetherimides, epoxy molding compounds, crosslinked silicones, phenols, polyphenylene ethers, reaction products and compositions comprising at least one of the foregoing resins.

[c5] 5.The method of Claim 1, wherein magnetically permeable block has a relative magnetic permeability of about 1 to about 2.

[c6] 6.The method of Claim 1, wherein the magnetically permeable block further comprises a recess adjacent to the magnetically impermeable stamper, and a gas source in fluid communication with the recess.

[c7] 7.The method of Claim 6, wherein the induction coil is disposed in the recess.

[c8] 8.The method of Claim 1, wherein the stamper further comprises a portion having a magnetic permeability of less than or equal to about 100 and a receiver having a magnetic permeability of greater than or equal to about 400.

[c9] 9.The method of Claim 8, wherein the receiver comprises the negative.

[c10] 10.The method of Claim 1, wherein the induction coil comprises a hollow conduit forming a thermal channel, and further comprising flowing a thermally convective medium through the thermal channel.

[c11] 11.The method of Claim 10, further comprising flowing thermally convective medium through the thermal channel to cool to a temperature below the softening temperature.

[c12] 12.The method of Claim 1, further comprising disposing a layer on the embossed substrate, wherein the layer is selected from the group consisting of a data storage layer, a protective layer, a dielectric layer, a reflective layer, and combinations comprising at least one of the foregoing layers.

[c13] 13. A method of forming an embossed substrate, comprising:
disposing a substrate a platen and a stamper comprising a negative of a desired surface feature, wherein the stamper is affixed to a magnetically permeable block comprising an induction coil, and wherein the stamper comprises a relative magnetic permeability gradient;
pressing the stamper and the substrate together;
passing an alternating electrical current through the induction coil; and
changing the alternating electrical current in the induction coil;
wherein the embossed substrate is formed.

[c14] 14.The method of Claim 12, further comprising flowing thermally convective medium through thermal channels in the magnetically permeable block to cool the substrate to a temperature below the softening temperature.

[c15] 15.The method of Claim 14, wherein the induction coil forms the thermal channels.

[c16] 16.A data storage media manufactured from the method of Claim 1.

[c17] 17.A data storage media manufactured from the method of Claim 13.

[c18] 18.An apparatus for embossing, comprising:

a first magnetically permeable block comprising an induction coil disposed in a recess; and

a first stamper disposed in operable communication with to the first magnetically permeable block, wherein the first stamper comprises a first negative of desired surface features.

[c19] 19.The apparatus of Claim 18, wherein the magnetically permeable block has a relative magnetic permeability of less than or equal to about 10 and the stamper has a relative magnetic permeability of greater than or equal to about 200.

[c20] 20.The apparatus of Claim 19, wherein the magnetically permeable block has a relative magnetic permeability of less than or equal to about 5 and the stamper has a relative magnetic permeability of greater than or equal to about 500.

[c21] 21.The apparatus of Claim 17, wherein the magnetically permeable block has a relative magnetic permeability of less than or equal to about 2 and the stamper has a relative magnetic permeability of greater than or equal to about 1,000.

[c22] 22.The apparatus of Claim 18, wherein the stamper comprises a relative magnetic permeability gradient.

[c23] 23.The apparatus of Claim 18, wherein the induction coil comprises a hollow conduit forming a thermal channel capable of receiving a thermally convective medium.

[c24] 24.The apparatus of Claim 18, wherein the induction coil comprises a coating on the walls of a channel capable of receiving a thermally convective medium.

[c25] 25.The apparatus of Claim 18, further comprising second magnetically permeable block comprising a second induction coil; and

a second stamper affixed to the second magnetically permeable block, wherein the second stamper comprises a second negative of desired second surface

features, and wherein the second negative is disposed on a side of the second stamper facing the first negative.